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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/540,725	03/16/2007	Shuiyuan Luo	930037-2008 A.0.14.US	7155
7590 Ronald R Santucci Frommer Lawrence & Haug 745 Fifth Avenue New York, NY 10151				
EXAMINER JOHNSON, JENNA LEIGH				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/540,725

Applicant(s)

LUO ET AL.

Examiner

Jenna-Leigh Johnson

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) 6-10, 16-35 and 50-63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 11-15 and 36-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/06)
Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :6/24/05,8/30/07,1/24/08,1/29/08,7/15/08.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group I, claims 1 - 5, 11 - 15, and 36 - 49, in the reply filed on June 28, 2010 is acknowledged. The applicant has amended the claims such that the spiral link fabric in claims 53 - 63 are made from fabric of claim 1. However, the restriction is based on a lack of unity, since the special technical feature is not considered to provide a contribution over the prior art. Thus, the groups were separated based on the structure of the final product recited in the claim and the spiral fabric of claims 53 - 63 is considered to be distinct from the general fabric, since the links of the overall fabric are distinct links formed from fibers or fabrics connected together by fasteners, to form a belt product, and just a general sheet or substrate made from only fibers or filaments. Therefore, claims 6 - 10, 16 - 35, and 50 - 63 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention.

Priority

2. Claims 1 - 5 and 11 - 15 are given priority to the filing date of the parent application, 10/334,513, filed on December 31, 2002. Claims 36 - 49, which include limitation not taught by application, 10/334,513, such as air handling abilities, moisture venting, groove's cross-sectional shape other than C-shaped, and square or rectangular shaped filaments, are granted priority back to the filing of the PCT Application, on December 19, 2003.

Drawings

3. The drawings are objected to because Figures 4A - 4D, which are suppose to be optical photomicrographs showing sample fabrics made from the shaped fibers, are mostly black with specs of white and do not show any distinguishable fabric or fiber structure. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure

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must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 - 5, 11 - 15, and 36 - 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. The phrase "having reduce air permeability compared with a fabric not having said monofilaments" in claim 1 is indefinite. It is unclear exactly what the applicant is comparing to the claimed fabric made from the grooved fibers. First, does the comparison fabric have the same fabric structure, are the fibers used in the comparison fabric any shape without a groove, or is the applicant only comparing the grooved fiber fabric to fabrics made with round fibers as set forth in the example in the application? Without being specific as to what the grooved fiber fabric is being compared to it is impossible to determine if there is a reduction in air permeability in the prior art. Further, it is unclear if the grooved fibers would have a reduction in air permeability as compared to fabrics made from flattened ribbon fibers, or other flattened fiber shapes which are known to have reduce air permeability as compared to similar structured fabric made from only round fibers. Applicant needs to be clear what the air reduction is compared to, so that the prior art can be properly evaluated for its air reduction properties. For purposes of examination the comparison is presumed to be a

fabric having a similar fabric and yarn construction made from 100% round filaments instead of any grooved or non-round filaments.

Claims 11, 36, and 40 are similarly rejected. Claims 2 - 5, 12 - 15, 37 - 39, and 41 - 49 are rejected due to their dependency on claim 1, 11, or 36.

7. The phrase "an open angle less than 180 degrees" in claim 4 is indefinite. The term "open angle" appears to be defined in the disclosure as the angle "centering at the origin of the "C" and facing its outlet". First, based on this definition it is unclear if the groove has to be a C-shaped groove to have an open angle as set forth in the definition. If so, does claim 3 have a different scope than claim 4? Second, it is unclear what is meant by the origin of the "C"? Is this where you would begin when drawing a C? And how is the angle "centered at the origin"? If the open angle is not limited to C-shaped grooves, would U-shaped or V-shaped grooves have an angle of less than 180 degrees? What groove shapes wouldn't have an open angle of less than 180 degrees? For purposes of examination, "C"-shaped grooves are considered to be semi-circular.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1 - 5, 11 - 15, 36 - 43, 48, and 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Dugan et al. (6,093,491).

Dugan teaches a fabric comprising fibers having a semi-circular shape channels (c-shaped) or grooves (Figure 2, Figure 9 column 3, lines 1 - 8). It is noted that a fabric made from the fibers of the present invention are considered to be uncoated because the configuration shown in Figure 2 is produced by co-

extruding the polymer coating and the main portion of the fiber in a single step (column 5, lines 29 - 34). Thus, the fiber is a bicomponent fiber and not a coated fiber. Further, the embodiment shown in Figure 9 is a second bicomponent configuration, wherein the grooves are only made from the hydrophilic component of the fiber and have no perceived material or coating lining the channels (column 5, lines 42 - 50). The moisture wicking fibers of Dugan can be used to produce any fabrics.

With regards to the reduced air permeability, the fabric of Dugan is considered to inherently possess a reduced air permeability, since the applicant has shown that adding grooves to fibers in a woven fabric would reduce the air permeability as compared to similar fabrics made from round fibers. Further, the fabric made from the grooved fibers would have a reduced air permeability as compared to open mesh or net fabrics. Thus, claims 1 - 3 are anticipated.

With regards to claim 4, the groove shape shown by Dugan is considered to inherently possess an open angle less than 180° since it has a very similar shape to the groove shape demonstrated by the applicant.

With regards to the improved adhesion to coating properties recited in claim 11, the fibers of Dugan are presumed to inherently possess improved adhesion to coating as compared to a round fiber, since the grooved structure, not only has an increase in surface area as compared to a round fiber of similar diameter, but the grooves also partially close at the surface, which would trap the harden coating within the grooves, i.e., a mechanical interlocking between the yarn and coating. Therefore, claims 11 - 14 are anticipated.

Further, the groove structure of Dugan is considered to inherently possess improved air handling properties since the grooves would allow air to travel through the channels of the fibers and away from the surface of the fabric, as compared to a fabric made from round fibers. Also, the grooves would inherently increase the void volume of the fabric as compared to a fabric made from round fibers, without changing the fabric's caliper because the grooves increase the voids within the fibers and do not change the overall diameter of the fibers. Thus, claims 36 - 39, and 43 are anticipated. Additionally, since the grooves of Dugan are similar in shape to the C shaped grooves of the invention, the fabric is considered to inherently

possess greater stability, improved sheet contact, reduced dusting, and moisture venting recited in claims 40 and 41.

Dugan teaches the fibers can be made from various polymers including polyamides, polypropylene, polyethylene, and polyesters (column 2, lines 49 - 65). Thus, claim 48 is anticipated.

With regards to claims 5, 15, and 42, it has been held that a recitation with respect to the manner in which a claimed product is intended to be employed does not differentiate the claimed product from a prior art product satisfying the claimed structural limitation. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Thus, the manner in which a fabric is used is not sufficient to distinguish the claimed product from the prior art.

With regards to claim 49, the method of fibers are extruded (column 5, lines 30 - 35).

Finally, it is noted that claims 1 - 5 are also rejected under *Res Judicata*, as set forth in §MPEP 706.03(w). The rejection over Dugan of claims similar to claims 1 - 5 was affirmed by the Board of Appeals in US Application 10/334,513, on May 26, 2006.

10. Claims 1 - 5, 11 - 15, 36 - 43, 45, 48, and 49 are rejected under 35 U.S.C. 102(e) as being anticipated by Eagles (2004/0127127).

Eagles discloses a fabric comprising a plurality of functional monofilaments shaped to provide an anchoring of a coating and improved resistance to peeling away of the coating (abstract). The monofilament includes a cavity formed in the surface of the monofilament which is wider at the bottom than at the open top (Figure 3A, paragraph 32). As shown in the figures the fibers are rectangular in shape and have grooves on one surface, producing a top surface profile different from the bottom surface profile. Further, the monofilament can include a plurality of cavities and the cavities can be other shapes (paragraph 32). Examples of shapes taught by Eagles include C-shape cavities (paragraph 28). The finished fabric can be used to produce industrial fabrics used in papermaking processes (paragraph 2). Thus, claims 11 - 15 are anticipated.

With regards to claim 1, the flattened, rectangular shaped fibers, shown in Figure 3A, would inherently produce a finished fabric having reduced air permeability to a fabric made from rounded fibers

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since the rectangular fibers can pack together more tightly than round fibers. Thus, claims 1 - 3 and 5 are rejected.

With regards to claim 4, the groove shape shown by Eagles is considered to inherently possess an open angle less than 180° since it has a semi-circular C-shape groove which is similar to the groove shape demonstrated by the applicant.

Further, with regards to the improved air handling properties, the grooves in the fibers would create extra void space in the fabric which would create channels for air to flow through. Thus, claims 36 - 39, 42, 43, and 45 are anticipated. Further, the grooved rectangular fibers would allow moisture to vent, since the channels would create void space in the fabric that moisture can travel through. Thus, claim 41 is anticipated. Finally, the fabric of Eagles is considered to inherently possess a thinner caliper, reduced permeability, greater stability, improved sheet contact, and reduced dusting, since it is using similar shaped fibers to produce the finished fabric, as what the applicant teaches produces the improved properties. Therefore, claim 40 is anticipated.

With regards to claim 48, Eagles discloses using polyester or polyamide fibers (paragraph 27).

With regards to claim 49, Eagles discloses that the fibers can be produced by extrusion (paragraph 29).

11. Claims 1 - 5, 11 - 15, and 36 - 49 are rejected under 35 U.S.C. 102(b) as being anticipated by Phillips et al. (5,925,434).

Phillips discloses a woven fabric comprising tape yarns (abstract). The tape yarns include a groove or a channel, shown as semi-circular or C-shaped (Figures 3A - 3C). The serrations may be on one or both sides of the tape yarn (column 7, lines 40 - 50). Further, the serrations can be in the same pattern on both surfaces (Figure 3B) or the placement can be staggered (column 8, lines 30 - 35). Finally, Phillips teaches that the yarns polypropylene, polyesters, and nylons (column 7, lines 30 - 37).

It is noted that while Phillips et al. discloses that the woven fabric can include a film coating, the invention of Phillips et al., includes an uncoated woven fabric with the serrated yarns as an intermediate product, which would meet the applicant's claim limitations.

With regards to the reduced air permeability, the fabric of Phillips et al. is considered to inherently possess a reduced air permeability, since the applicant has shown that adding grooves to fibers in a woven fabric would reduce the air permeability as compared to similar fabrics made from round fibers. Also, the flat tape structure would help to reduce air permeability as compared to round fibers. Further, the fabric made from the grooved fibers would have a reduced air permeability as compared to open mesh or net fabrics. Thus, claims 1 - 3 are anticipated.

With regards to claim 4, the groove shape shown by Phillips et al. is considered to inherently possess an open angle less than 180° since it has a semi-circular C-shape groove which is similar to the groove shape demonstrated by the applicant.

With regards to the improved adhesion to coating properties recited in claim 11, the fibers of Phillips et al. are presumed to inherently possess improved adhesion to coating as compared to a round fiber, since the grooved structure has an increase in surface area as compared to a round fiber of similar diameter, which would inherently improve the adhesion properties of the fabric, as compared to a round fiber fabric, and help to create a mechanical interlocking between the yarn and coating. Therefore, claims 11 - 14 are anticipated.

Further, the groove structure of Phillips et al. is considered to inherently possess improved air handling properties since the grooves would allow air to travel through the channels of the fibers and away from the surface of the fabric, as compared to a fabric made from round fibers. Also, the grooves would inherently increase the void volume of the fabric as compared to a fabric made from round fibers, without changing the fabric's caliper because the grooves increase the voids within the fibers and do not change the overall diameter of the fibers. Thus, claims 36 - 39, and 43 - 48 are anticipated. Additionally, since the grooves of Phillips et al are similar to the U or C shaped grooves of the applicant's invention, the fabric is

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considered to inherently possess greater stability, improved sheet contact, reduced dusting, and moisture venting recited in claims 40 and 41.

With regards to claims 5, 15, and 42, it has been held that a recitation with respect to the manner in which a claimed product is intended to be employed does not differentiate the claimed product from a prior art product satisfying the claimed structural limitation. *Ex parte Masham*, 2 USPQ2d 1647 (1987). Thus, the manner in which a fabric is used is not sufficient to distinguish the claimed product from the prior art.

Finally, the yarn can be produced by extrusion (column 7, lines 58 - 61). Thus, claim 49 is anticipated.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claims 44, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eagles in view of Phillips et al.

The features of Eagles and Phillips et al. have been set forth above. While Eagles discloses that the monofilaments can have a plurality of grooves, Eagles fails to teach that the grooves can be on both surfaces, or that the grooves would be aligned or staggered on the different surfaces. Phillips et al. is drawn to grooved tape yarn. Phillips et al. teaches that the grooves can be on both surfaces of the tape yarn and that the grooves on the top surface can be aligned with or staggered from the grooves on the bottom surface (column 7, lines 40 - 50 and column 8, lines 25 - 40). Thus, it would have been obvious to one having ordinary skill in the art to one of ordinary skill in the art that the plurality of grooves suggested by Eagles could have been added to both surfaces and in staggered or aligned configurations, as taught by Phillips et al. to create a grooved rectangular fiber. Further, it would have been an obvious matter of design choice to add

grooves to both surfaces in aligned of staggered configurations, since such a modification would have involved a mere change in the shape of a component. A change of shape is generally recognized as being within the ordinary level of skill in the art. *In re Dailey*, 357 F.2nd 669, 149 USPQ 1966. Thus, claims 44, 46, and 47 are rejected.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jenna-Leigh Johnson whose telephone number is (571) 272-1472. The examiner can normally be reached on Monday - Wednesday (8:30 - 4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jlj
July 29, 2010

/Jenna-Leigh Johnson/
Primary Examiner, Art Unit 1786